Application No. 10/529,684
In Reply to Office action of August 2, 2007
Confirmation No. 1688

Amendment to the Claims:

This listing of claims 1-13 will replace all prior versions, and listing of claims in the application. Claims 1-12 have been amended. Claims 13-19 have been added.

Listing of Claims

1. (Currently Amended) A memory ~~Memory~~ device comprising:

an array of bit cells for storing data bits in a corresponding ~~information plane comprising an electro-magnetic material constituting an~~ array of bit locations, the array of bit cells constituting an information plane wherein each of said bit locations includes an electromagnetic material, wherein a magnetic state of said electromagnetic material at said ~~a~~ bit locations represents ~~location representing~~ the logical value thereof, and

an array of electro-magnetic sensor elements that are aligned with the bit locations,

~~characterized in that~~ wherein the information plane comprising said array of bit cells is programmable or programmed via a magnetic field induced via a separate magnetic writing device.

2. (Currently Amended) A device ~~Device~~ as claimed in claim 1, wherein the array of electromagnetic sensor elements comprise read-only magnetic sensor elements that are sensitive to, but unable to change, said magnetic state of the electromagnetic material.

3. (Currently Amended) A device ~~Device~~ as claimed in claim 1 ~~or 2~~, wherein the device further comprising ~~comprises a~~ housing for encapsulating the array of electromagnetic sensor elements, which housing has an interface surface for cooperating with a programming surface of the writing device for receiving ~~a said~~

magnetic field for magnetizing the electromagnetic material at the bit locations.

4. (Currently Amended) A device ~~Device~~ as claimed in claim 1 ~~or 2~~, wherein the device further comprising ~~comprises~~ a housing for encapsulating the array of electromagnetic sensor elements, which housing has a protective cover for preventing selectively changing said magnetic state at the bit locations via said ~~a~~ magnetic field.

5. (Currently Amended) A device ~~Device~~ as claimed in claim 4, wherein the protective cover comprises a magnetic ~~magnetically~~ shielding material.

6. (Currently Amended) A device ~~Device~~ as claimed in claims 1 ~~or 2~~, wherein the electromagnetic sensor elements comprise read-write elements that are aligned with further bit locations of said information plane, which read-write elements are sensitive to, and also able to change, said magnetic state of the electro-magnetic material.

7. (Currently Amended) A device ~~Device~~ as claimed in claim 6, wherein the read-only sensor elements and the read-write elements are arranged in a single array.

8. (Currently Amended) A writing ~~Writing~~ device for programming a memory device as claimed in claim 1, ~~characterized in that~~ wherein the writing device comprises:

a programming surface for cooperating with the information plane of the memory device, and

means for generating a magnetic field via controllable radiation beams at the programming surface for magnetizing the electromagnetic material at each bit location of the array of bit locations of the information plane.

9. (Currently Amended) A writing ~~Writing~~ device as claimed in claim 8, wherein for ~~programming a memory device as claimed in claim~~ 3, ~~characterized in~~ that the programming surface is arranged for cooperating with ~~the~~ an interface surface of ~~the~~ a housing of the memory device.

10. (Currently Amended) A writing ~~Writing~~ device as claimed in claim 8 or 9, wherein the means for generating a magnetic field comprise at least one of ~~the following~~: an array of individually controllable write elements that ~~are individually controllable~~; ~~or~~ an array of permanent magnetic elements; ~~or~~ a magnetic head; ~~and~~ scanning means for scanning the information plane at the programming surface via a magnetic ~~the~~ head.

11. (Currently Amended) A method ~~Method~~ of manufacturing a memory device ~~as claimed in claim~~ 1, the method comprising: ~~a step of~~

(a) constructing an information plane comprised of an array of bit cells at predefined bit locations, wherein each bit cell is programmable or programmed via a magnetic field induced via a separate magnetic writing device;

(b) providing a predetermined amount of magnetic material at each bit cell;

(c) constructing an array of electro-magnetic sensor elements that are aligned with the bit locations of the array of bit cells,
~~a step of magnetizing the electromagnetic material at the bit locations of the memory device according to predefined data.~~

(d) programming the information plane via a separate writing device via magnetization of the electromagnetic material at the bit locations of the information plane; and

(e) providing the memory device in a housing, said housing providing a protective cover for preventing selectively changing said magnetic state at the bit locations via said magnetic field

~~magnetizing an the electromagnetic material at the bit locations according to predefined data before encapsulating the device~~.

12. (Currently Amended) A method ~~Method~~ of programming a memory device ~~as claimed in claim 1~~ using an external ~~a~~ writing device ~~as claimed in claim 8~~, the method comprising ~~the step of~~ :

(e) aligning a programming surface of said memory device over an information plane of said memory device to be programmed to achieve a one to one alignment of bit locations of the information plane and field generator elements of said external writing device; and

(f) generating, via the field generator elements, a magnetic field at the bit locations to magnetize ~~magnetizing~~ the electromagnetic material at the bit locations of the memory device according to predefined data ~~date~~.

13. (New) A device as claimed in claim 1, wherein said device is fully M-RAM compatible.

14. (New) A method of programming a memory device as claimed in claim 12, wherein said alignment is performed via one of: active alignment utilizing one or more actuators, optical sensing via optical markers provided on said memory device.

15. (New) A method of manufacturing a memory device as claimed in claim 11, wherein the protective cover comprises a magnetic shielding material.

16. (New) A method of manufacturing a memory device as claimed in claim 11, wherein the protective cover comprises a magnetic shielding material.

17. (New) A method of manufacturing a memory device as claimed in claim 11, wherein the array of electromagnetic sensor elements comprise read-only magnetic sensor elements that are sensitive to, but unable to change, said magnetic state of the electromagnetic material.

18. (New) A method of manufacturing a memory device as claimed in claim 1, wherein the electromagnetic sensor elements comprise read-write elements that are aligned with further bit locations of said information plane, which read-write elements are sensitive to, and also able to change, said magnetic state of the electro-magnetic material.